

APPENDIX A

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**RECEIVED
CENTRAL FAX CENTER****In re United States Patent Application of:****Applicants: BARETZ, Bruce H. and
TISCHLER, Michael A.****Application No.: 10/623,198****Date Filed: July 18, 2003****Title: SOLID STATE WHITE LIGHT
EMITTER AND DISPLAY
USING SAME****Docket No.:****4241-198 CON- 01 2005****Examiner:****Thao X. Le****Art Unit:****2814****Conf. No.:****2836****Customer No.:****23448****DECLARATION OF BRUCE H. BARETZ UNDER 37 CFR §1.131 IN U.S. PATENT
APPLICATION NO. 10/623,198**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, BRUCE H. BARETZ, hereby declare:

1. THAT I am a co-inventor with MICHAEL A. TISCHLER of the subject matter disclosed and claimed in United States Patent Application No. 10/623,198 filed July 18, 2003 in the United States Patent and Trademark Office in the names of Bruce H. Baretz and Michael A. Tischler and entitled, "SOLID STATE WHITE LIGHT EMITTER AND DISPLAY USING SAME" (hereafter referred to as the "Application"), which was filed as a continuation of United States Patent Application No. 08/621,937 filed March 26, 1996 in the names of Bruce H. Baretz and Michael A. Tischler for "SOLID STATE WHITE LIGHT EMITTER AND DISPLAY USING SAME," on which U.S. Patent No. 6,600,175 issued on July 29, 2003.
2. THAT the Application discloses and claims the invention of a light emitting device and assembly ("Invention"), that the Invention has been claimed in various independent claims in

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the Application, and that such independent claims in the Application are claims 1, 18 and 40 as set out below:

1. A light emitting assembly comprising a solid state device coupleable with a power supply constructed and arranged to power the solid state device to emit from the solid state device a first, relatively shorter wavelength radiation, and a down-converting luminophoric medium arranged in receiving relationship to said first, relatively shorter wavelength radiation, and which in exposure to said first, relatively shorter wavelength radiation, is excited to responsively emit radiation in the visible white light spectrum.

18. A light emitting assembly comprising a solid state device coupleable with a power supply constructed and arranged to power the solid state device to emit from the solid state device a first, relatively shorter wavelength radiation, and a down-converting luminophoric medium arranged in receiving relationship to said first, relatively shorter wavelength radiation, and which in exposure to said first, relatively shorter wavelength radiation, is excited to responsively emit second, relatively longer wavelength radiation, so that white light is emitted by the light emitting assembly.

25 A light emission device, comprising an LED energizable to emit radiation in the blue to ultraviolet spectrum, and a luminophoric medium arranged to be impinged by radiation from the LED in the blue to ultraviolet spectrum and to responsively emit radiation in a range of wavelengths, so that radiation is emitted from the light emission device as a white light output.

3. THAT I am aware that the Application has been examined by the United States Patent and Trademark Office, that I have read the March 2, 2005 Office Action issued by the United States Patent and Trademark Office, and that I am aware that claims of the Application as currently pending have been rejected as being unpatentable, including: a rejection of claims 1, 18 and 25 identified above, and claims 2-9, 19-20 and 26-29, respectively dependent thereunder, as unpatentable under 35 U.S.C. §102(e) over the disclosure of U.S. Patent 5,535,230 (Abe); a rejection of claims 10-13, dependent under claim 1, and claim 30, dependent under claim 25, as unpatentable under 35 U.S.C. §103(a) over the disclosure of Abe in view of the disclosure of U.S. Patent 5,777,350 (Nakamura et al.); and a rejection of claims 14-17, dependent under claim 1, as unpatentable under 35 U.S.C. §103(a) over the disclosure of Abe in view of the disclosure of U.S. Patent by 5,677,417 (Muellen et al.) and

the disclosure at page 18 of the Application of certain commercially available fluorescent materials.

4. THAT I and MICHAEL A. TISCHLER have been informed by our legal representatives that the rejection of the claims of the Application can be overcome by presenting evidence to the United States Patent and Trademark Office of possession by me and MICHAEL A. TISCHLER of our claimed Invention prior to the earliest effective dates of U.S. Patent 5,535,230 (Abe) and U.S. Patent 5,777,350 (Nakamura et al.), and U.S. Patent 5,677,417 (Muellen et al.), and that said effective dates have been identified to us by such legal representatives as January 3, 1995 for U.S. Patent 5,535,230 (Abe) (such date hereafter being referred to as "Abe Effective Date"), as November 30, 1995 for U.S. Patent 5,777,350 (Nakamura et al.) (such date hereafter being referred to as "Nakamura et al. Effective Date"), and August 29, 1995 for U.S. Patent 5,677,417 (Muellen et al.) (such date hereafter being referred to as "Muellen et al. Effective Date"), our legal representatives having also informed us that U.S. Patent 5,677,417 (Muellen et al.) was based on an international patent application, PCT/EP94/01345, having a publication date of November 10, 1994 (such date hereafter being referred to as "Muellen et al. Publication Effective Date").
5. THAT attached as Exhibit 1 hereof is a true and exact copy, as redacted, of a "MEMO" identifying me as the author ("From: Bruce H. Baretz") and the recipient as Duncan Brown of Advanced Technology Materials Inc. ("To: Duncan Brown" immediately below which is set out "Company: Advanced Technology Materials Inc."); that this "MEMO" was sent to Advanced Technology Materials Inc. in my role as a consultant for that company, in which role I interacted with MICHAEL A. TISCHLER, who at that time was employed as a scientist by ATMI; that Duncan Brown was at that time a Vice President of Advanced Technology Materials Inc., to whom MICHAEL A. TISCHLER reported; that the "MEMO" has a date that has been blacked out ("Date: [REDACTED] [date blacked out]"), but which date is prior to the Abe Effective Date, the Nakamura et al. Effective Date, the Muellen et al. Effective Date and the Muellen et al. Publication Effective Date; that the "MEMO" is titled "REFERENCE: White Light Light Emitting Diodes (LED)" and contains the following text:

"REFERENCE: White Light Light Emitting Diodes (LED)

Duncan -

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Enclosed are some samples of the Lumogen dyes already cast into PMMA sheets. These dyes may be useful, when incorporated into polycarbonate LED lenses, to attenuate and shift the light emission from UV or blue (assumming [sic] a GaN die) to either a green, yellow, or red emission, or some combination of these emissions. An appropriate combination would, in theory, generate white light.

"I will see if I can get some information on purchasing these Lumogen dyes already mixed into polycarbonate."

wherein such quoted text contains the acronym "LED" denoting light emitting diode, the acronym "PMMA" denoting polymethylmethacrylate, the acronym "UV" denoting ultraviolet, and the chemical symbol "GaN" denoting gallium nitride, in describing the Invention as embodied in a white light LED ("White Light Light Emitting Diode"), a light emitting device including a "UV or Blue ... GaN die," a solid state emitter of radiation of a first, relatively shorter wavelength and "Lumogen dyes," a down-converting luminophoric medium, discussed as being "useful ... to attenuate and shift the light emission from the UV or Blue (assumming [sic] a GaN die) to either a green, yellow, or red emission, or some combination of these emissions," with "[a]n appropriate combination" being proposed to "generate white light."

6. THAT attached as Exhibit 2 thereof is a true and exact copy of a "FAX NOTE" annotated with the handwritten date "1/9/95;" that such "FAX NOTE" was sent by me to Duncan Brown of Advanced Technology Materials Inc. and is annotated with the handwritten note, "Copy to MAT - JRE -" identifying the initials "MAT" of my co-inventor MICHAEL A. TISCHLER and the initials "JRE" of Janet R. Elliott; that Janet R. Elliott was the person responsible for coordinating patent activities at Advanced Technology Materials Inc.; that such "FAX NOTE" contains the following text:

"Duncan - here are some words for you to pass through to your patent attorney. It is my hope that these ideas form the basis for a patent.

Please let me know how I can help get this patent written and assigned to ATMI.

Bruce,"

wherein such quoted text contains the acronym "ATMI" denoting Advanced Technology Materials Inc.; that such "FAX NOTE" as sent to Advanced Technology Materials Inc.

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From: Bruce Barabz The Dunham Group

Date: 10/08/2005 Time: 08:23:40

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Kean Solutions, Inc.

Patent & Prior Art Search: White Light Emitting Diodes Based on Fluorescent Impregnation
01/08/95 Date: 01-07-95

AB On the basis of a kinetic model of Yb^{3+} - Er^{3+} system, an anal. was made of the performance of $\text{YF}_3\text{:Yb}^{3+}$, Er^{3+} IR-to-visible conversion source with cooperating light emitting diode driven with rectangular current pulses.

RI. AN 90:177497 HCA

TI Infrared-to-blue up-converting phosphor

AU Wojciechowski, Jerzy; Pawelaka, Irene

CS Inst. Electron Technol., Sci. Prod. Cent. Semicond., Warsaw, Pol.

SO Electron Technol. (1978), 11(3), 31-47

CODEN: ETNTAT; ISSN: 0070-9516

DT Journal

LA English

AB The emission spectrum of the $\text{YF}_3\text{:Yb}^{3+}$, Tm^{3+} up-converting phosphor was studied, which resulted in the introduction of schematic manners for both energy transfer and radiative deexcitation in the Yb^{3+} - Tm^{3+} system. Principal performance characteristics were data. for such type of up-converting phosphor-light-emitting diode system acting as a blue emission source.

4. Invention

a. Development of a white light emitting diode using a blue or UV light emitting diode die and a fluoroscer or combination of fluorophors encapsulated within the plastic encapsulating dome above the active layer of said die. The fluorophors are chosen in such a manner that they absorb the monochromatic light emission from the UV or blue light emitting die and spontaneously emit the absorbed light as fluorescent or phosphorescent light emissions over a broader spectrum and bathochromic to the original wavelength of emission. With the spontaneous re-emission of light over a broad range of wavelengths, the appearance of said light can be adjusted to appear white of any shade or hue.

b. Development of a light emitting diode using a blue or UV light emitting diode die and a fluoroscer or combination of fluorophors where the spontaneously emitted fluorescence or phosphorescence is a broad emission and is of any color or hue other than the color of the initial emission from the light emitting diode die.

c. Development of a light emitting diode using a blue or UV light emitting diode die and a segregated assembly of fluorescent or phosphorescent dies such that different portions of the plastic encapsulating dome emits color of different wavelengths and hence provides a multiple color lamp products.

d. Development of a light emitting diode lamp using a blue or UV light emitting diode die whereby the incidence of illumination is dramatically increased by virtue of the spontaneous fluorescence

included a 13 page document prepared by me, a true and exact copy of which is contained in Exhibit 2, containing on the first page thereof the text:

**"White Light Emitting Diodes Based on Fluorescent Impregnation
Invention Report**

Prepared by: Bruce Baretz, Keen Solutions, Inc. on Jan 7, 1995,"

that above such text is the handwritten annotation "ATMI Record of Invention #95-2 ATMI File No. 198" evidencing acceptance by Advanced Technology Materials Inc. of such Invention Report and entry thereof into its invention records; that Keen Solutions, Inc. was the business entity under which my consulting services were rendered to Advanced Technology Materials Inc.; that such Invention Report and accompanying the FAX NOTE constitute a total of 14 pages; that the Invention Report contains the following text:

"The invention relates to the utilization of a single source (typically monochromatic) light emitting diode die that activates (photoexcites) the ground state of suitable fluorophors encapsulated in a polymeric matrix (or otherwise placed in a non-active region of the light emitting diode assembly), whereby these fluorophors, after photoexcitation, re-emit their absorbed energy at a wavelength and wavelengths bathochromic to the initial wavelength of the emission coming from the active layer of the light emitting diode" [page 2 of 14];

"In this invention, the white light emission can be obtained using a single light emitting diode die and a composition of a single or mixture of suitable fluorophors that emit a broad range of wavelengths, thereby offering a white light." [Page 2 of 14];

"Invention

a. Development of the white light emitting diode using a blue or UV light emitting diode die, and a fluorescer or combination of fluorophors encapsulated within the plastic encapsulating dome above the active layer of said die. The fluorophors are chosen in such a manner that they absorb the monochromatic light emission from the UV or blue light emitting die and spontaneously emit the absorbed light as fluorescent or phosphorus light emissions over a broader spectrum and bathochromic to the original wavelength of emission. With the spontaneous re-emission of light over a broad range of wavelengths, the appearance of said light can be adjusted to appear white of any shade or hue." [Page 10 of 14];

"g. Development of a light emitting diode where an electrical pulse is delivered (to minimize power drain from the battery source) but where a continuous period of illumination is realized by adjustment of the luminescence lifetimes of suitable phosphors." [Page 11 of 14];

in describing the Invention.

7. THAT the Invention Report of Exhibit 2 after its submission to Advanced Technology Materials Inc. was processed as an invention record by such company and communicated to patent counsel who prepared a patent application that was reviewed by me and my co-inventor MICHAEL A. TISCHLER and filed in the U.S. Patent and Trademark Office on March 26, 1996 as U.S. Patent Application No. 08/621,937.
8. THAT I and my co-inventor MICHAEL A. TISCHLER executed a Declaration and Power of Attorney filed in said U.S. Patent Application No. 08/621,937 declaring ourselves to be original, first and joint inventors of the subject matter claimed and for which a patent was sought in said U.S. Patent Application No. 08/621,937.
9. THAT I and my co-inventor MICHAEL A. TISCHLER executed an assignment of said U.S. Patent Application No. 08/621,937 in favor of Advanced Technology Materials Inc., which assignment was recorded in the U.S. Patent and Trademark Office.
10. THAT I offer Exhibit 1 with this Declaration as evidence of the conception by me and MICHAEL A. TISCHLER of the Invention disclosed and claimed in the Application prior to the Abe Effective Date, the Nakamura et al. Effective Date, the Muellen et al. Effective Date and the Muellen et al. Publication Effective Date, and I offer Exhibit 2 with this Declaration as evidence of continuing diligence by me and MICHAEL A. TISCHLER concluding in the constructive reduction to practice of the Invention by the filing of said U.S. Patent Application No. 08/621,937 on March 26, 1996.

As a below-named declarant, I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements are made with the knowledge that willful false statements, and the like so made, are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the present application or any patent issued thereon.


BRUCE H. BARETZ

1 JULY 2005
DATE

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